Altogether we are not favourably impressed with this part of the work, and do not deem it likely to accomplish the author's forecast in his preface, viz. "aid in the elevation of the sciences of physical geography and meteorology, now sciences of *observation*, to sciences of *principle*."

The last part of the work, treating of aqueous surface-waves, which we have not space to notice in detail, is a considerable improvement on the foregoing chapters. We are surprised, however, to see that while some notice is taken of the researches of M. Flaugergues and Mr. J. Scott Russell, no reference is made to those of the late Mr. Froude.

In conclusion, the type and illustrations are decidedly good, and though we cannot describe it otherwise than as a preliminary investigation into certain portions of the dynamics of certain fluids, accompanied by a good deal of speculation and deduction which still requires verification, and which is sometimes palpably erroneous, it nevertheless represents a very laudable, and to some extent successful endeavour on the part of the author to fill up a gap that admittedly exists in this abstruse branch of science. E. D. A.

HANDBOOK OF INVERTEBRATE ZOOLOGY

Handbook of Invertebrate Zoology for Laboratories and Sea-side Work. By W. K. Brooks, Ph.D. (Boston, 1882.)

THE series of notes and directions issued under this title by Mr. Brooks, of the Johns Hopkins University, Baltimore, is an interesting evidence of the progress which the practical study of zoology is making in American universities, and more especially of the valuable services which the Baltimore University is rendering to education in science. The book consists of brief notes describing the appearances of a series of invertebrate animals before and during successive stages of dissection or development, as the case may be. Diagrammatic sketches (for the most part original, or copied with a few original touches from English authors) are introduced into the text. The animals chosen by Mr. Brooks are the following:—Amœba, Paramecium, Vorticella, Sycandra (Calcispongiæ), Eucope (Leptomedusæ), Mnemopsis (Anthomedusæ), Asteracanthion, Arbacia (Echinid), Lumbricus, Macrobdella (Hirudinean), Callinectes (Brachyurous Decapod Crustacean), Cyclops, Acridium (Orthoptera), Anodonta, Loligo.

Concerning each of these forms the reader will find original remarks and often detailed observations illustrated by sketches. At the same time the writer does not pretend to offer us a series of monographs, but merely such notes as will be eminently serviceable to students in the laboratory. It is no doubt to American students and especially to Mr. Brooks's own pupils that this work will be useful. Such descriptions as that of the development of Arbacia, and those relating to the Medusæ, have their value immensely increased when it is possible to place in the hands of the student the identical material—or perhaps we should say the counterpart of that material—which has served for the preparation of the descriptions which are to guide the student's observation.

Though class-students in this country will not gain much assistance from Mr. Brooks's notes, professed zoologists will be interested in his treatment of the subject, and may glance with advantage at the more detailed sections, such as that on the Lamellibranch gill, on the anatomy of the Squid, and on the Medusæ.

If we ventured on a criticism, it would be to suggest a doubt as to whether the types selected and the relative importance given to their treatment are altogether such as would commend themselves to a teacher who aimed at introducing students to a wide view of animal morphology. Naturally enough, Mr. Brooks has given notes and drawings relating to several animals which he has been able to study attentively. It is, however, hardly wise on his part to repeat in a student's handbook the account of the development of the oyster which he has already published elsewhere. This account, which was inconsistent with the previous results of other investigators of molluscan embryology (my own included) has been recently shown by Horst to be based upon error. So, too, it would be well if in a new edition of his notes Mr. Brooks were to take into account the later results which have been obtained as to the anatomy of the earth-worm and of leeches, and would revise both his drawings and statements in various sections of the book, where they touch upon distinctly histological matters.

The day is not far distant when we shall see inscribed over the door of every zoological laboratory, "Let no one enter here unversed in histology." Geometry was not less indispensable for the intelligent student of Greek science than histology is rapidly becoming for the modern zoological student. The question is how to find time (except in countries where time is *not* money) to make the student first a histologist, and then a zoologist.

E. RAY LANKESTER

OUR BOOK SHELF

Cameos from the Silver-land; or, The Experiences of a Young Naturalist in the Argentine Republic. By E. W. White. 2 vols. Vol. II. (London: J. Van Voorst, 1882.)

THIS second volume has been slow to make its appearance, having been printed at Buenos Ayres. It gives an account of the author's voyage up the Uruguay, his trip to Rioja, Catamarca, and Tucuman, a journey to Salta, and a voyage down the Paraná. There is a good deal of interesting information in this volume, though it contains very much less natural history than we expected. The wonderful resources of the Republic are well brought before us, resources only too feebly made use of; for it is a land of promise teeming with treasures, with a splendid river porterage, and needing only labour and capital to become very great. To a reader wishing to know the actual state of things at present existing in this country we can recommend these two volumes of Mr. White's as most instructive reading.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The Recent Aurora

LAST night, between 8 and 9 p.m., there was visible here a very fine display of Northern lights, the finest indeed that I

© 1882 Nature Publishing Group

have yet witnessed. The sky was nearly unclouded, and the moon had not yet risen; a band of light forming an arc extended from west to east, under the Polar Star. It just touched, by its upper boundary, the stars γ and β of the Great Bear, and nearly touched by its lower fringe the star Cor Caroli; this gives some idea of its breadth. Beams of light extended from the upper fringe towards the North Star, with greater or less intensity, fading away, however, very rapidly. Towards 9.30 p.m. the eastern end of the arc became very luminous; immense beams spread up into the heavens, mostly parallel to the direction of the pointers. On the extreme east, a portion of the aurora presented that beautiful violet tint which is so relatively rare in these latitudes. Some of the beams towards the centre of the arc also presented this colour, but only momentarily.

The arc, varying in intensity from moment to moment, rose towards the North Star, and became diffused, and towards 9 o'clock, the moon then appearing, nearly entirely disappeared; faint beams still, however, showing themselves from time to time. The summit of the arc was as nearly as possible under the North Star. J. P. O'Reilly

Royal College of Science for Ireland, Dublin, October 3

A bright aurora was seen here last evening (October 2). When first observed, at 7.0 p.m., the arc in the north-west was very distinct; at the same time two cloud-like patches of light were seen in the north-east at an elevation of about 30°. At 7.10 the display reached its greatest brilliancy, narrow streamers extending upwards from the arc, as frequent intervals; several pale flashes of light taking place over the arc. At this time the light patches had been replaced by others, and several new ones had appeared rapidly, the whole series forming a large arc springing from the east-north-east point, and extending towards the west-south-west, at 7.20 nearly forming a complete arch. By 7.30 the sky had become much overcast; still the strong glow continued in the north-west, while a lighting up of the clouds indicated the continued occurrence of the light patches. At 9.30 the sky was clear again, and every trace of aurora had vanished. The light of the aurora was quite colourless.

Kenley, Surrey, October 3 Sydney Evershed

Last night, the 2nd inst., I here witnessed a very fine specimen of the *Aurora Borealis*. It was in the form of radiating lines or ribs, having spaces between, equal to the width of the ribs, namely, equal light and equal shadow; the whole springing from a centre about 15° from the zenith in a south-westerly direction. When I first perceived the light, at 6.45 p.m., it was faint and of the colour of moonlight, and was not distinctly traceable all over, but by filling up the void, in the mind's eye, the whole gave the appearance of an immense dome. Fifteen minutes later it had all disappeared, but at 7.15 it began to flash out in different places like slow lightning, principally at the zenith, much brighter than before, but still of the same colour, and around the centre the light took the shape of a sort of eccentric vortex ring. W. J. Lineham

University Club, Newcastle-on-Tyne, October 3

About a quarter to seven this evening I became aware that an aurora was in the sky. A clear, persistent light showed itself near the northern horizon, whilst in the eastern sky fluctuating luminous regions formed an arc between 7h. and 7h. 15m. I noticed the position of that arc with respect to the constellations Aries and Pegasus. It began under α and β Arietis, at about, say, 5° north of the equator, and stretched parallel to a line through γ and α Pegasi, also at about 5° north of the equator. At times the arc extended further towards the south-western horizon. At about 7h. 30m. a remnant of the arc shot a ray diagonally to the square formed by the four stars of Pegasus, *i.e.* from γ to β Pegasi. The colour of the aurora was pale white in the northern light; in the arc it was white, approaching slightly to a green approximate to that of the magnesium light.

Gustave Plarr

22, Hadlow Road, Tunbridge (Kent), October 2

A rather uncommon display of aurora was seen here last evening, from about 7.15 to 7.40 p.m. Large patches of light, brilliantly white, were seen in the south and south-east, at a rough guess, extending from 10° to 15° in length and breadth, sometimes shifting quickly from place to place, at others remaining stationary for a minute or two, but not attaining a greater average altitude than 30° or 40° from the horizon. They were slightly convex at the base, giving the appearance of a bank of clouds below. On looking to the north, a long, low arch of light was visible, with one or two long streamers, which rapidly disappeared, but the brilliancy was nothing compared with the patches before mentioned.

In connection with this display, perhaps it may be as well to mention that not only is there an enormous sun-spot passing over the sun's disc, but five other groups, one of which was nearly central yesterday, and showed signs of great disturbance in the course of a few hours. Elizth. Brown

Further Barton, Cirencester, October 3

An Insect Attacking a Worm

On September 19, 1882, I was waiting for a train at Laqueville, in the Puy-de-Dome district of France, when I noticed a very large worm in the meadow, moving very rapidly from side to side. I touched it with my umbrella, expecting to see it retire into its hole, but, taking no notice of my touch, it continued its forward movement, and drew itself out of its hole with a jerk. I then saw that attached to the end of its tail was a caterpillar-like insect—no doubt the larva of some beetle—about $1\frac{1}{4}$ inch long, the back covered with a series of shining black bands, and the belly, which was furnished with a few short feet at the head and tail, was of dull greenish yellow. This insect, without relaxing its hold of the worm, which was moving along more rapidly than I ever saw a worm move before, gradually shifted its bite along the belly of the worm till it had bitten about two inches, or rather less than one-third the whole length of the worm, which was more than six inches long. This it accomplished in about ten minutes, the bitten portion turning livid and swelling considerably, the worm's power of motion gradually ceasing. The insect then relaxed its hold, and crawled back along the back of the worm, and, seizing its tail, attempted to drag it backward, but finding the worm had still the power of slightly moving forward, it rapidly bit the belly of the worm where it had previously bitten it, and by this time the worm's power of forward motion had entirely ceased. The insect then appeared to survey the ground for some two feet behind the worm, and again seizing the tail, and fastening its own tail to a stalk of clover, it pulled strongly, not directly, but bending the worm sideways round a stalk of grass; gradually, very gradually, the swelled tail of the worm lengthened, and then I saw the whole body come back as it were a ring at a time, with a sort of resilient motion. The insect thus gained about one quarter of an inch, and in an hour and a half had drawn the worm in a sinuous line about 9 or 10 inches. I was unable to observe longer, but I have no doubt the insect would eventually drag the worm back into the latter's own hole, where it had first attacked it.

No doubt such an incident is extremely common in France, where there are few birds, but I fancy the numerous birds in England may have nearly extirpated such an enemy of worms, which would form with the dead worm a somewhat conspicuous object for two or three hours. Edwin Lawrence

White Ants

Having observed in Nature (vol. xxvi. p. 343) some remarks regarding White-ants' nests, it has occurred to me to put on record the following fact, which came under my observation.

A lady residing in Madras had a set of plain table glass ware in a cupboard, which had not been opened for some time. On looking into it one day, she found the glass more or less covered with the mud indicative of the presence of white-ants. The glass articles were at once removed and washed, but wherever the mud had been applied by the insects, it was found that the glass had a frosted appearance, which no amount of scrubbing would remove. Some of the articles were then sent to me for inspection, and I found that the lustrous surface of the glass had been completely destroyed, as if by some powerful corrosive, wherever the ant-mud had been in contact with it.

We know well enough the substances used for etching on glass, but I shall feel obliged if any of your correspondents will explain how these insects managed to act on it in the destructive manner specified. G. Bidie

Museum, Madras, September 3

© 1882 Nature Publishing Group